U.S. Department of Energy
Washington, D.C

PAGE CHANGE

DOE O 420.1 Chg 2

10-24-96

SUBJECT: FACILITY SAFETY

1. PURPOSE. This Page Change transmits the revised pages of DOE O 420.1, FACILITY SAFETY, of 10-13-95.

2. EXPLANATION OF CHANGE. These changes accommodate comments made by the Defense Nuclear Facilities Safety Board.

3. FILING INSTRUCTIONS.

a.

Remove Page(s)	Dated	Insert Page(s)	Dated
3 and 4	10-13-95	3	10-13-95
		4	10-24-96
		4a (and 4b)	10-24-96

b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:

ARCHER L. DURHAM
Assistant Secretary for
Human Resources and Administration

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INITIATED BY:
The Office of Environment, Safety and Health

U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 420.1

Approved: 10-13-95
Review Date: 10-13-97
Chg 1: 11-16-95
Chg 2: 10-24-96

SUBJECT: FACILITY SAFETY

1. OBJECTIVE. The objective of this Order is to establish facility safety requirements related to: nuclear safety design, criticality safety, fire protection and natural phenomena hazards mitigation.

2. CANCELLATION. The Orders listed below are canceled. Cancellation of an Order does not, by itself, modify or otherwise affect any contractual obligation to comply with such an Order. Canceled Orders which are incorporated by reference in a contract shall remain in effect until the contract is modified to delete the reference to the requirements in the canceled Orders.

   a. DOE 5480.28, NATURAL PHENOMENA HAZARDS MITIGATION
   b. DOE 5480.7A, FIRE PROTECTION
   c. DOE 6430.1A, GENERAL DESIGN CRITERIA (NUCLEAR AND EXPLOSIVES SAFETY REQUIREMENTS)
   d. DOE 5480.24, CRITICALITY SAFETY

3. APPLICABILITY.

   a. DOE Elements. Except for the exclusions in paragraph 3c, this Order applies to DOE Elements with responsibility for DOE-owned or leased facilities as follows (see Attachment 1, Table 1, "Facility and Activity Applicability"):

      (1) 4.2, 4.4 All DOE nuclear and non-nuclear facilities.

      (2) 4.1, 4.3 All DOE non-reactor nuclear facilities which are classified as Hazard Categories 1, 2, or 3; and explosives facilities.

   b. Contractors. Except for the exclusions in paragraph 3c, the Contractor Requirements Document (CRD), Attachment 2, sets forth requirements that are to be applied to the universe of contractors awarded contracts for management and operating contracts. Contractor compliance with the CRD will be required to the extent set forth in a contract. Contractors shall be directed to continue to comply with the requirements of Orders canceled by this Order until their contracts are modified to delete the reference to the requirements of the canceled Orders.

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potential for accidents with significant public radiological impact); the use of equipment and administrative controls which restrict deviations from normal operations and provide for recovery from accidents to achieve a safe condition; means to monitor accident releases required for emergency responses; and the provision of emergency plans for minimizing the effects of an accident.
Facilities shall be sited and designed in such a manner that gives adequate protection for the health and safety of the public and for workers, including those at adjacent facilities, from the effects of potential facility accidents involving the release of radioactive materials.

All nuclear facilities with uncontained radioactive materials (as opposed to material contained within drums, grout, and vitrified materials) shall have means to confine them. Such confinement will act to minimize the spread of radioactive materials and the release of radioactive materials in facility effluents during normal operations and potential accidents. For a specific nuclear facility, the number and arrangement of confinement barriers and their required characteristics shall be determined on a case-by-case basis. Factors that shall be considered in confinement system design shall include type, quantity, form, and conditions for dispersing the material. Engineering evaluations, trade-offs, and experience shall be used to develop practical designs that achieve confinement system objectives. The adequacy of confinement systems to effectively perform the required functions shall be documented and accepted through the Safety Analysis Report.

Facilities shall be designed to facilitate safe deactivation, decommissioning and decontamination at end of life.

Facilities shall be designed to facilitate inspections, testing, maintenance, and repair and replacement of safety SSCs as part of an overall reliability, availability, and maintainability program. The objective is that the facility can be maintained in a safe state, including during these operations, and in keeping with the as low as is reasonably achievable (ALARA) principle for occupational radiation exposure.

Facilities shall be designed to keep occupational radiation exposure within statutory limits and incorporate ALARA principles in design, including design provisions to facilitate decontamination during the operational period.

Facility process systems shall be designed to minimize the production of wastes and minimize the mixing of radioactive and non radioactive wastes.

Vertical line denotes change.

Safety SSCs identified in accordance with this section shall, commensurate with the importance of the safety functions performed, be designed: (1) so that they can perform their safety functions when called upon to operation, and (2) under a quality assurance program that satisfies 10 CFR 830.120.

Facility safety class electrical systems shall be designed to the basic approach outlined in Section 5.2.3 (Electrical) of "Implementation Guide for Nonreactor Nuclear Safety Design Criteria and Explosives Safety Criteria."

4.1.2 Explosives Safety

The safety design of all new DOE explosives facilities and all modifications to existing explosives facilities shall conform to the DOE explosives safety requirements established in the DOE Explosives Safety Manual, DOE M 440.1-1. Facility structural design and construction shall comply with the requirements of TM5-1300, Structures to Resist the Effects of Accidental Explosions, and DOE/TIC-11268, A Manual for the Prediction of Blast and Fragment Loading of Structures. Blast-resistant design for personnel and facility protection shall be based on the TNT equivalency of the maximum quantity of explosives and propellants permitted. In accordance with TM5-1300, the TNT equivalency shall be increased by 20% for design purposes.